

Appl. No. 09/998,050

REMARKS

This is in response to the Office Action of 04 October 2004. Claims 1-21 are pending in the application, Claims 1-8 and 10-21 have been rejected, and Claim 9 has been objected to.

By this Response and Amendment, Replacement Sheets that include Figs. 1-4 are submitted, the Specification is amended, and Claims 1, 3, 10, and 18 are amended.

No new matter has been added.

In view of the amendments above and remarks below, Applicants respectfully request reconsideration and further examination.

About The Invention

The present invention relates generally to methods and apparatus for preventing external noise from influencing random number generators that are based on the meta-stable behavior of flip-flops. More particularly, embodiments of the present invention recognize when a plurality of flip-flops in a meta-stable state issue a bit within a predetermined period of time, and discard the generated bits as being influenced by external noise.

Drawings

The Examiner states that Figs. 1-4 should be labelled as "Prior Art" because they illustrate the invention of patent applications 09/519,549 and 09/912,685.

Submitted herewith are Replacement Sheets in which Figs. 1-4 have been labelled as "Prior Art".

The Examiner has also objected to Figs. 5-8 stating that the recited limitation of at least two flip-flops is not shown.

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Applicant respectfully traverses the objection to Figs. 5-8 and requests that this objection be withdrawn. More particularly, each one of Figs. 5-8 show the two circuit blocks 400-1 and 400-2, which are referred to in the specification as core random elements. The detailed contents of circuit blocks 400-1 and 400-2 are shown in Fig. 4, and include both a flip-flop 410 intended to be operated in a meta-stable state, and a series of synchronizing flip-flops 440, 441, and 442. Since each of Figs. 5-8 contain two instantiations of the core random element circuit block, and each instantiation includes at least one flip-flop designed to operate in a meta-stable state, it can be seen that each illustrative embodiment shown in Figs. 5-8 contain at least two flip-flops. Thus the recited limitation of a plurality of flip-flops operated in the meta-stable state is shown in each one of Figs. 5-8. In view of the foregoing, Applicant respectfully submits that the objection to Figs. 5-8 is improper and should be withdrawn.

Specification

The Examiner has required that the information cited in the cross-reference to related applications be updated.

By this response, the cross-reference to related applications has been amended to state that Application No. 09/519,549, is now U.S. Patent 6,631,390.

Non-narrowing Amendment of Claim 3

Claim 3 has been amended in a non-narrowing manner to correct a spelling error. More particularly, the word "lease" has been corrected to read "least". This spelling correction is not intended to change the scope of Claim 3.

Allowable Subject Matter

Applicant thanks the Examiner for the indication of the allowability of Claim 9.

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Rejections under 35 USC §102(e)

Claims 1-8 and 10-21 have been rejected under 35 USC §102(e) as being anticipated by Epstein (US Patent 6,631,390).

Independent Claims 1, 10, and 18 have been amended to recite delay circuitry connected to the flip-flops that are intended to enter into meta-stable states. This clearly distinguishes the invention defined by the amended Claims from the disclosure of Epstein.

Epstein discloses circuits containing one flip-flop intended to be driven into a meta-stable state along with a series of flip-flops intended to avoid entering the meta-stable state which operate to synchronize the output of the meta-stable flip-flop with another signal. The Examiner has equated the plurality of synchronizer flip-flops of Epstein to the plurality of meta-stable flip-flops, which in Applicant's claimed invention, are used collectively to detect the influence of external noise.

Applicant's amended Claims make clear that a plurality of flip-flops intended to be driven into meta-stable operation (i.e., those flip-flops connected to delay circuitry) is required, and not simply a plurality of flip-flops. By operating a plurality of the similar circuit blocks, the claimed invention can, to a high probability, detect the influence of externally applied noise. Epstein does not disclose multiple instantiations of such circuitry, or the ancillary circuits coupled to these multiple instantiations, that are used to detect the influence externally applied noise.

In view of the foregoing, Applicant respectfully submits that the rejection of independent Claim 1, 10, and 18 under 35 USC §102(e) has been overcome. Similarly, Applicant submits that the rejection of dependent Claims 2-8, 11-17, and 19-21, has also been overcome.

Further, Applicant submits that the cited reference does not suggest or provide motivation for Applicant's claimed invention.

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Conclusion

All of the objections and rejections in the outstanding Office Action of 04 October 2004 have been responded to, and Applicant respectfully submits that the pending Claims 1-21 are now in condition for allowance.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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